XVII. *Observations on the species of the Homopterous genus* Orthezia, *with a description of a new species.* By J. W. Douglas.

[Read July 6th, 1881.]

Having recently* examined the bibliography and synonymy of the known species of *Orthezia*, I do not further allude to this part of the subject; and having, at the June meeting of this Society, exhibited examples of all the three species hereafter mentioned, and communicated a note thereon,† I have now to offer a few more observations respecting them, with illustrative figures, and a description of one which I consider to be new. I have to premise that in all the stages of their existence all the species have a covering of cereous matter, which on the under side is close-fitting to the body, and on the upper side forms on the entire circumference a border of laterally connected laminations, varying in form in the different species, while on the dorsal surface the matter assumes a form and pattern varying, yet constant in character, in the respective species. The winged males are exceptions, being destitute of the wax-like envelope, and also the very youngest forms (which I have not seen) are without projecting laminæ, those of *O. urticæ* being so described by Léon Dufour.

1. *Orthezia urticæ*, Linn.

Up to the middle of October I find, on various plants, only young examples of both sexes, 1 line in length. I hesitate to call these larvæ, because if the account given by l'Abbe d'Orthez be true, that the winged males are developed and after coupling die, the females, which at that season exist only in the small forms represented by fig. 5, must then be fecundated, and afterwards have

* 'Entomologists' Monthly Magazine,' xvii., pp. 172 and 203 (1881).

† Proceedings, p. ix.

an ecdysis, and be developed into the large adults found at the end of May on *Stellaria holostea*, when the large egg-pouch or marsupium, which has been originated in the meantime, is full of yellowish eggs (about thirty) enveloped in a fine cottony web or flue.

On the adult female, whose total length is $2\frac{1}{2}$ lines, there is first, a large, thick, bilobed projection over the head; conjoined to this, on the dorsal surface of the body, are two highly projecting parallel ridges, composed of seven or eight thick, subangular, backwardly directed, closely overlapping plates, leaving between the ridges a deep longitudinal furrow, which, like them, extends to the end of the body. The furrow is quite regular and smooth, but at the base of the ridges on the outer side is generally a series of small supplementary scales; by these ridges the segments of the body are quite hidden. The circumferential laminæ, starting at right angles to the base of the frontal projection, somewhat narrow and rounded on their anterior margin, directed backwards, project laterally, in regular succession, to a considerable extent, each lamina (on the sides) (6 to 7) showing a little beyond the one immediately preceding it, the posterior ones (three on each side) being greatly elongated, sometimes curved, and lying in the side grooves of the marsupium, but not above half their length, and the terminal middle one, arising just at the anal orifice, either lying depressed in the middle groove of the marsupium, or elevated at an acute angle. I am not sure if this elevation be a voluntary act on the part of the insect, nor if the lamina ever assume the procumbent position; often it is broken off, for all the laminæ are removable with the slightest touch.

The marsupium, consisting of cereous matter of a thin shell-like structure, formed (apparently) in two plates, at any rate easily separable into two, is attached at the base to the abdomen, but extends far beyond it; the lower plate convex; the upper one flattened, the space between them forming a large cavity in which the eggs are deposited and hatched. The lower plate arises immediately behind the posterior coxæ, and is perfectly smooth; the upper plate, constituting half the apparent length of the insect, has its surface deeply channelled lengthwise, the middle channel wide and rounded out, the others (three on each side of it) narrow, the intervening divisions thin, simulating laminæ, as I previously termed them.

I have said that I hesitate to call the small autumnal forms larvæ, and for this reason, that with the females I also then find male forms of the same size (known by the two projecting posterior laminæ), and if the females be then fertilised by winged males (as has been said), they cannot be in the larva-state. But it is equally certain that some males, at any rate, do not acquire wings in the autumn, for I find, at the end of May and up to the middle of June, some of the same forms as in the autumn, and scarcely larger, along with the gravid females. Now, the question, is for what purpose have these males existed through the winter, and for what purpose do they still exist? If they shall yet become winged, what end can they then serve unless to attend on a generation of females at the present time unborn, but which will also have, according to precedent, a contemporaneous generation of males? Or will they serve the purpose of procreation without becoming alate, and thus show that they are in the perfect condition, and that, in this species at least, the male is dimorphous? That winged males are very rare, we know; it may well be that only a few, at times, attain this perfection of development; still, the existence of apterous males, whether perfect or not, side by side with females having marsupia already full of full-sized eggs, is a curious subject for elucidation. It is scarcely a probable solution that the said eggs have yet to be fertilised by males not yet developed. Are the females then, in some generations, agamous, or does parthenogenesis exist here?

There is an accessible figure of the winged male in the frontispiece of Westwood's 'Introduction to the Modern Classification of Insects.' The denuded female is figured by Léon Dufour in his 'Recherches sur les Hémiptères,' pl. ix., fig. 102.

2. *Orthezia cataphracta*, Shaw.

The form is broad-oval, the denuded body yellowish, the cereous covering matter cream-white. In the adult female—length 2 lines, including the marsupium—the frontal node is bilobed, thick and not much projecting; the laminæ of the circumference short, all of equal breadth, curved under, the posterior ones only being a little longer than the others, forming altogether a raised compact border. On the back, the segmentation

is distinctly visible throughout, the cereous matter taking the form of each segment; the body in early life flat, afterwards distended; the segment next to the frontal node entire, the rest divided by a median impressed line, *on* which, in the first three of the divided segments, is a very small scutelliform nodule, and at the end of the line, immediately adjoining the laminæ of the circumference, is a short somewhat elevated lamina arising at the anal orifice and projecting over them. The marsupium is short (varying in length), broad, the posterior angles rounded off; the upper surface, arising below the circumferential border, but distinctly separate from it, nearly flat, having only eight or nine slightly raised longitudinal lines; the lower surface, arising at the posterior coxæ and hiding the abdomen, convex, perfectly smooth, the end curved upwards. Antennæ and legs pale piceous. Sometimes the upper surface, more rarely the lower also, assumes a smoky hue.

In the first days of April last, Mr. George Norman found, about the base of the stems of grass and *Carex* growing among long damp moss at Pitlochry, in Perthshire, some hibernated examples of this species, male and female, the latter having then no development of marsupium: these I failed to keep alive. In May, I received from the same gentleman, a supply of females with the marsupium partly, rarely fully, developed, and also two or three males. Some of these I managed to keep alive until the 12th of June, when a part of the females had the marsupium quite developed and full of white eggs, and a part still remained with only a small marsupium; the males being but little increased in size, and at most but 1½ line long. Mr. Norman tells me that young ones began to appear in the first week of June, and from the first had the scale-like covering. The same curious question also arises with this species as with *O. urticæ*, namely, why the males co-exist with the gravid females? and it is also unknown if any winged males ever appear.

3. *Orthezia Normani*, n. s.

♀. Corpus flavidum vel pallide piceum cera alba tectum; antennis pedibusque flavidis his interdum piceis; corporis laminis circumgentibus prominentibus, quatuor primis latis planis antice rotundatis, vel quarta

curvata, cæteris angustis; segmentis dorsalibus tribus vel quatuor anterioribus singulariter lamina lævi suberecta medio valde emarginata fere divisa instructis, cæteris rectis nec vel lævissime laminatis; marsupio longitudinaliter canaliculato.

Body yellowish or piceous, covered with white cereous matter; antennæ and legs yellowish, the latter sometimes piceous, with the extremity blackish; frontal node obtusely angulated, the margins usually recurved so that the middle appears sulcate; of the circumferential laminæ the first four broad, flat, rounded on the front edge, projecting; or the first three only have this character, the fourth being longer and curved outwards (as in fig. 12), the remainder narrower and straight, adhering to and not separable from the elongate canaliculation of the marsupium; of the dorsal segments that next the frontal node has an erect angulated lamina, the next three or four have each a broad, delicate, suberect, forwardly directed lamina, which is deeply cleft, almost divided, in the middle, so that each side appears with a greatly rounded projecting edge; the other segments straight, with, at most, only a slight trace of lamination; at the anal orifice is a short lamina either lying flat or slightly elevated; the marsupium varies much in length, sometimes being only half that of the rest of the insect, and sometimes, but more rarely, as long as the other portion of the insect; the upper surface canaliculate, the under surface very convex, the end much recurved. Length $1\frac{1}{2}$—2 lines.

I have not seen a male form. There are small individuals—1 line long—found with the females, but as all I have met with have a trace of a marsupium, they cannot be males. The lamellation of this species is very delicate, and so easily abraded that it is rare to get an example quite perfect.

Early in April Mr. Norman sent me from Pitlochry four specimens (which he found with *O. cataphracta*), with the remark that the lamination differed from that of that species, and in May he sent a further supply alive, and it was evident he was correct in his observation. On the 28th May, at Bexley Wood, Kent, I also had the pleasure of finding this species on a bank, among the stems of grass and other plants and dead leaves and *débris*; I have seen examples from Mr. C. W. Dale, and I have no doubt it exists in other collections. I have

great pleasure in dedicating the species to him who, if not its discoverer, first pointed out its differential characters.

Finally, as will have been observed, there are several points in the natural history of these very remarkable insects that require to be cleared up, and, as I have no expectation that I shall ever do this, it is to be hoped that some of our younger members who have the time and opportunity may be induced to give attention to the necessary research.

Postscript.—I have just received the following note from Mr. Norman :—"Pitlochry, July 8th. I am sure you will be glad that I have at length bred the winged male of *O. cataphracta*. After having had the brood bottled up since the end of March, and having constantly added fresh-caught specimens, I was beginning to despair, but to day I found the one I now send to enable you to have it figured. I should mention that in the bottle are a few *O. Normani*, but the chances are a hundred to one in favour of this one being *O. cataphracta*."

The example may be described as follows :—

O. cataphracta, male.—Grey-white. Wings (two, anterior) diaphanous, at the base narrow, then immediately widening on the lower side, the whole contour being a long broad oval; close to the nearly straight anterior margin is a strong raised nerve, which ends at about the middle of the length; from this, at a little distance from the base, furcates a slight nerve directed towards the inner margin, but not reaching it, and becoming evanescent at about the same distance from the base as the strong costal nerve. The antennæ slender, filiform, about one-third shorter than the wing, the articulation obscured. Head, thorax, and abdomen also obscured by a white mealy powder; from the end of the abdomen projects a divergent pencil of about twelve white hairs, which is fully as long as the whole insect. The legs are also covered with the same kind of mealy powder, and there is a trace of it on the wings. Length, exclusive of tail, $\frac{1}{2}$ line; expanse of wings, $1\frac{3}{4}$ line.—J. W. D., 11th July.

Explanation of Plate XV.

Fig.					
1.	*Orthezia urticæ*, Linn.			Female;	upper side.
2.	,,	,,	,,	,,	lower side.
3.	,,	,,	,,	,,	side view showing the erect posterior lamina.
4.	,,	,,	,,	,,	marsupium with eggs.
5.	,,	,,	,,	,,	as found in autumn.
6.	,,	,,	,,	Male;	as found in May.
7.	,,	,,	,,	,,	as found in May; lower side.
8.	*Orthezia cataphracta*, Shaw.			Female;	upper side.
9.	,,	,,	,,	,,	lower side.
10.	,,	,,	,,	Male;	as found 12th June.
11.	,,	,,	,,	,,	as found 12th June; lower side.
12. 13.	*Orthezia Normani*, Doug.			Female;	upper side.
14.	,,	,,	,,	,,	lower side.
15.	,,	,,	,,	,,	antenna.
16.	*Orthezia cataphracta*.			Winged male.	